

Unit 12

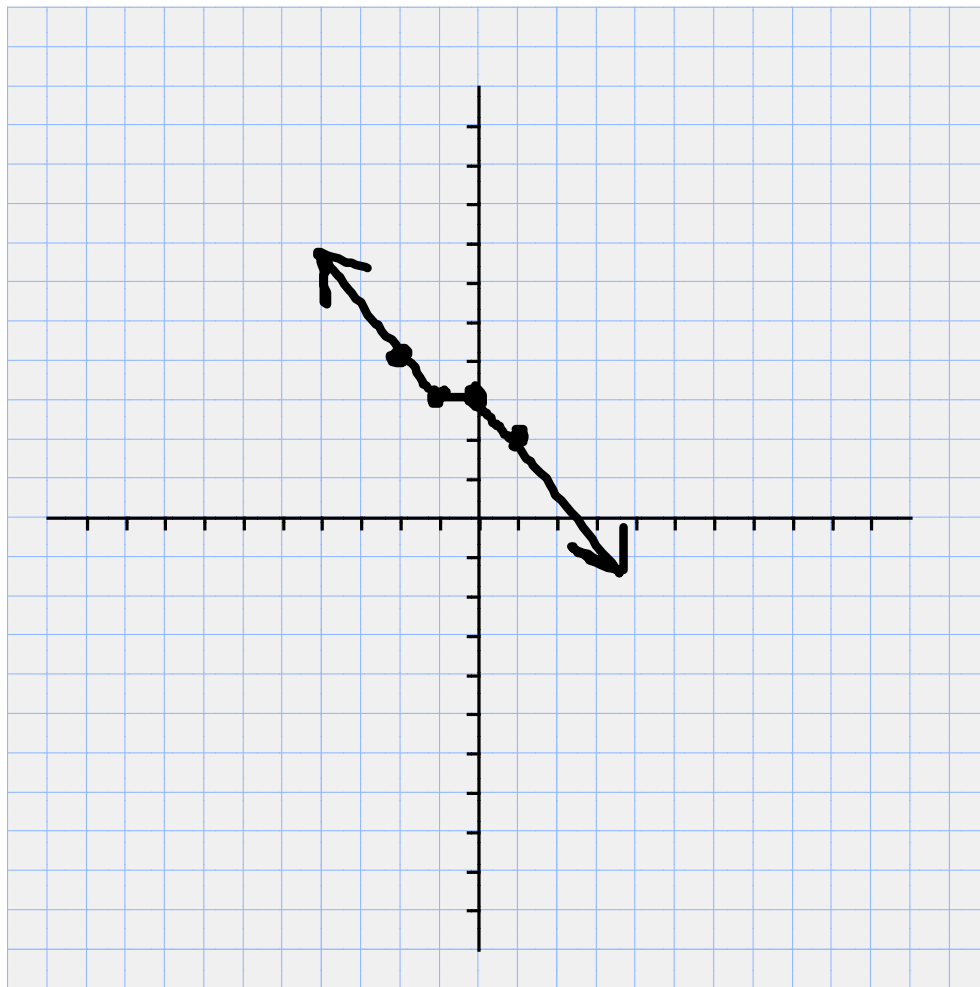
Day 7

Symmetry

11 a) $y = g(-x) + 1$

↑ over y

↑ up

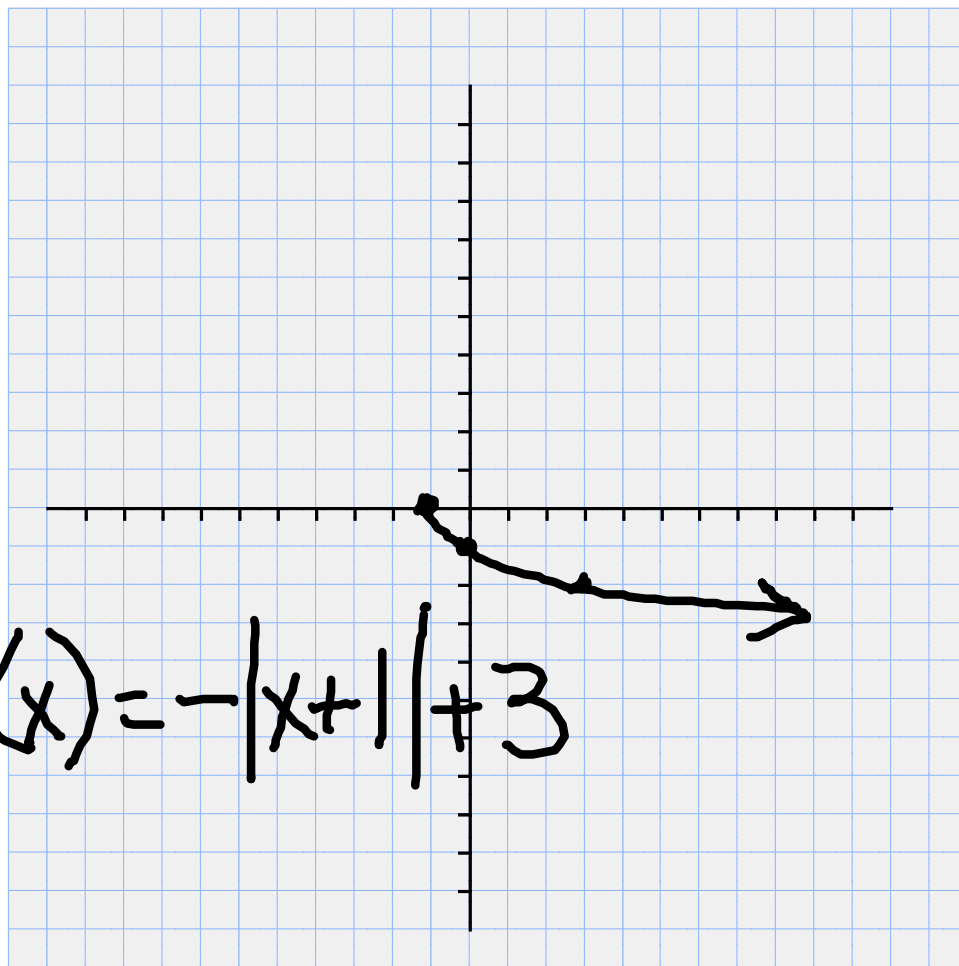


12) a) $y = -f(x)$
over x

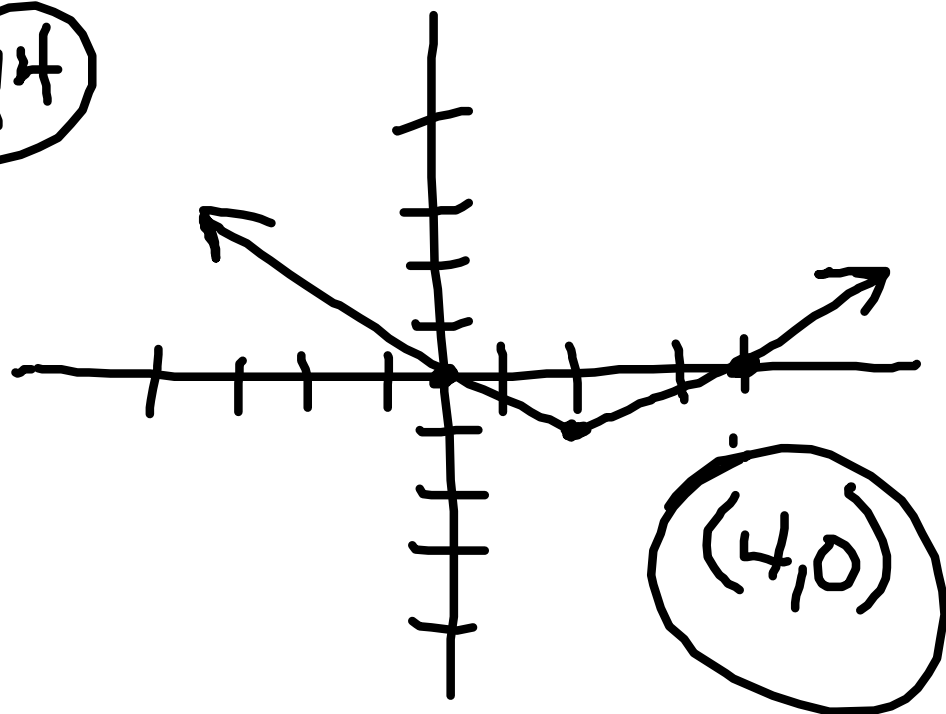
(21) $(-1, 3)$

$(0, 0)$

$$f(x) = -|x+1| + 3$$



(24)



$$f(x) = |x|$$

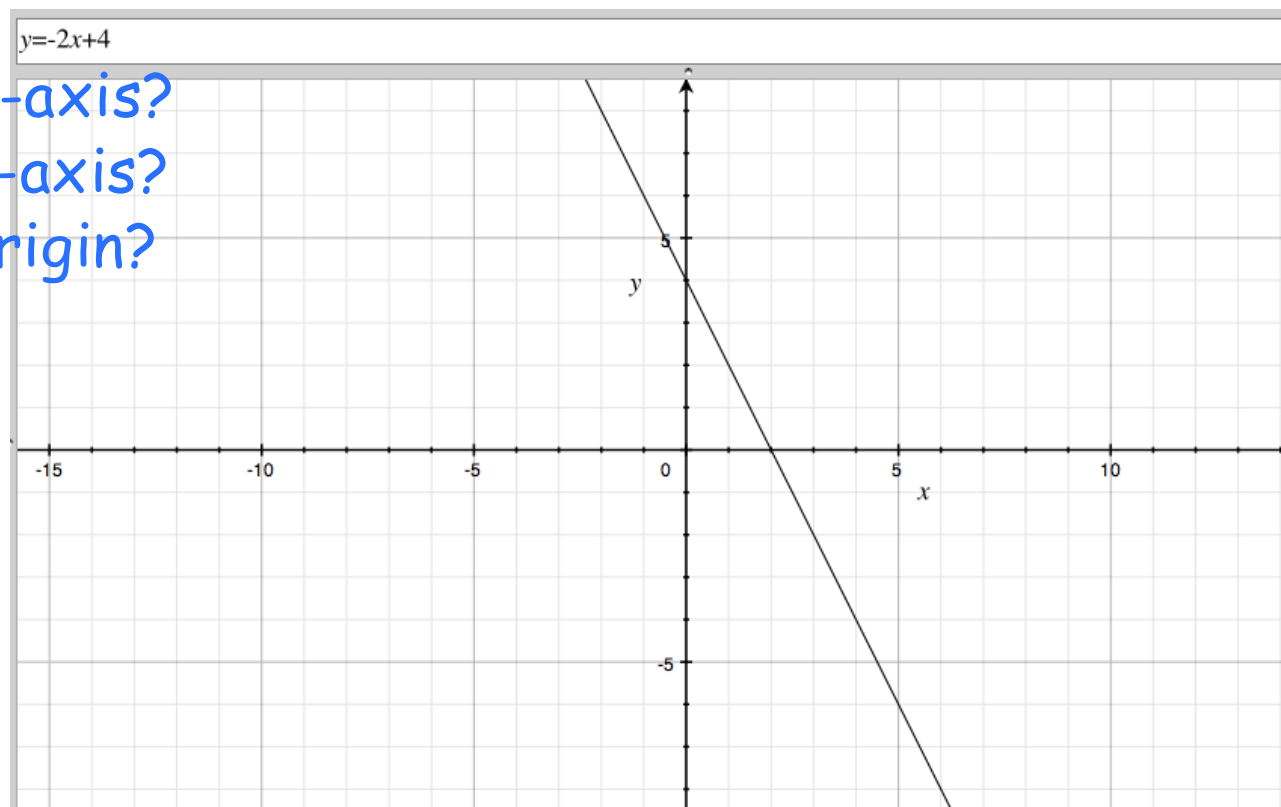
$$f(x) = \frac{1}{2} |x - 2|$$

↑

A function whose graph is symmetric with respect to the Y-AXIS is called an EVEN FUNCTION.

A function whose graph is symmetric with respect to the ORIGIN is called an ODD FUNCTION.

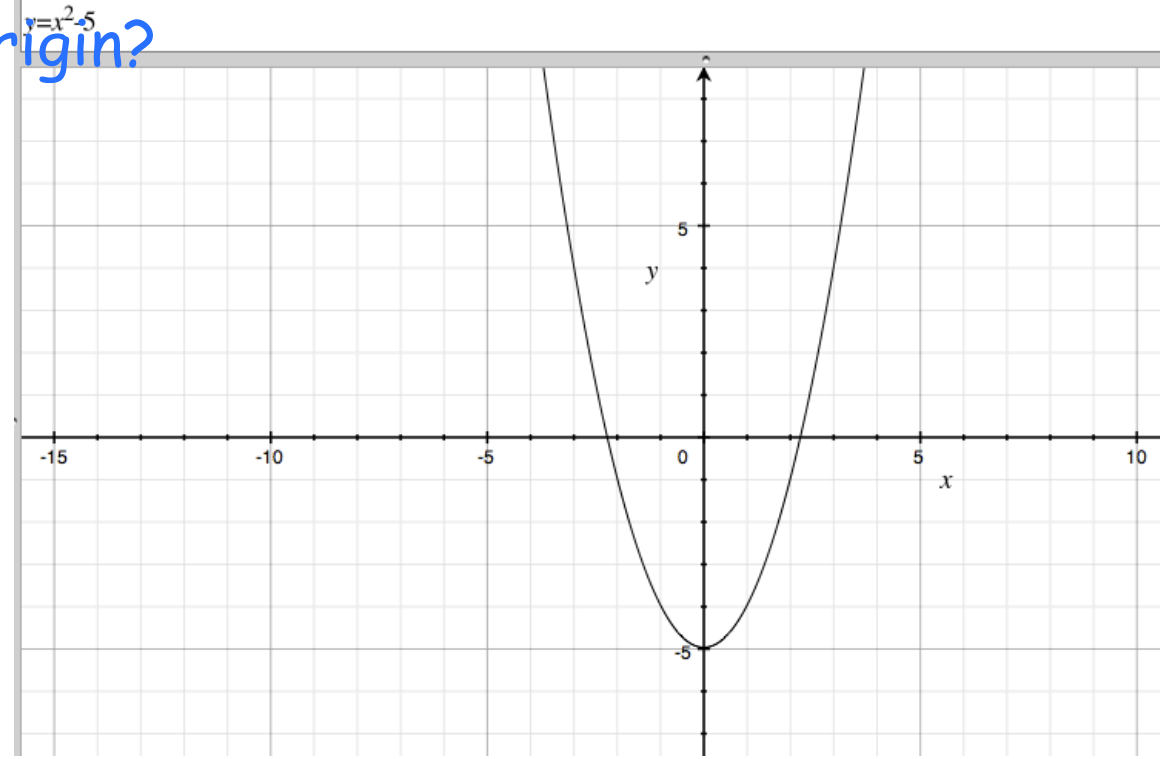
Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?



Symmetric to x-axis?

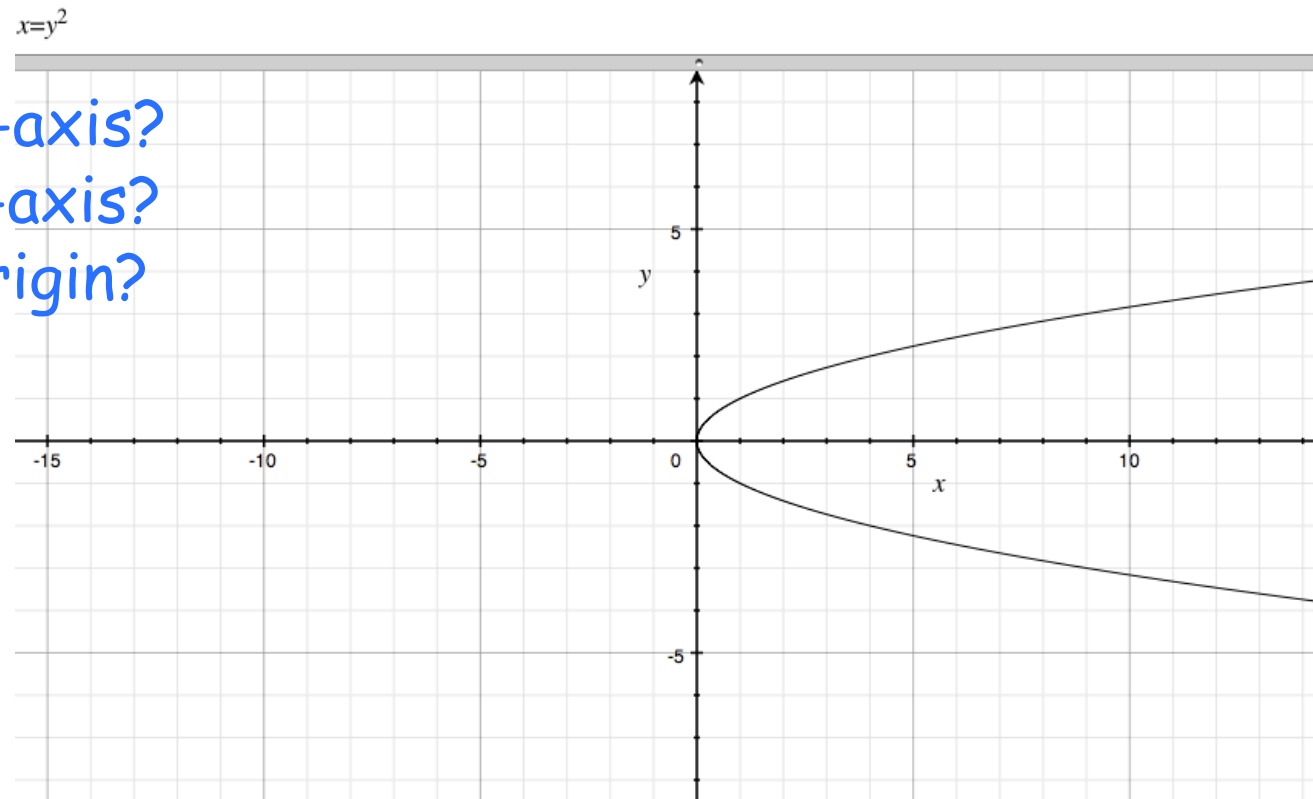
Symmetric to y-axis?

Symmetric to origin?



Function?

Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?

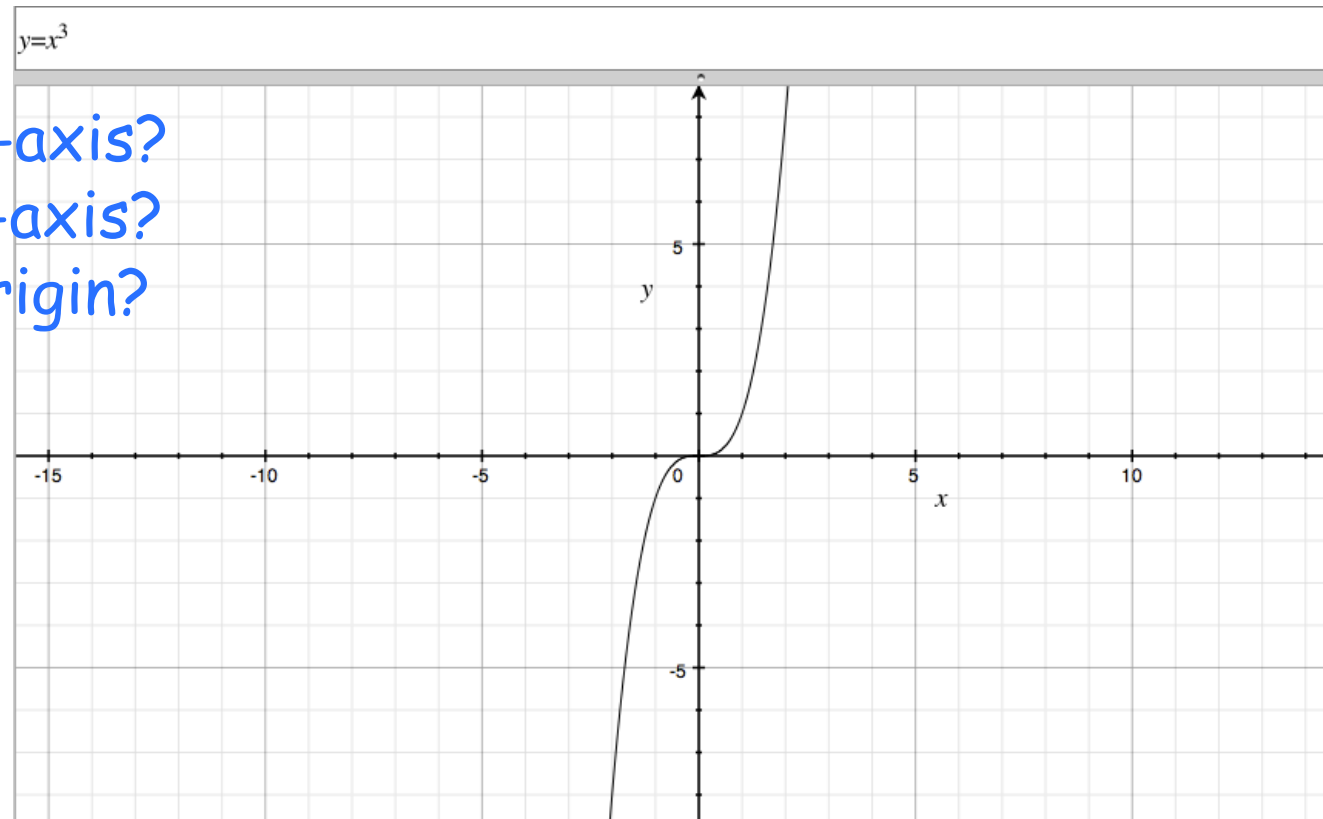


Function?

Symmetric to x-axis?

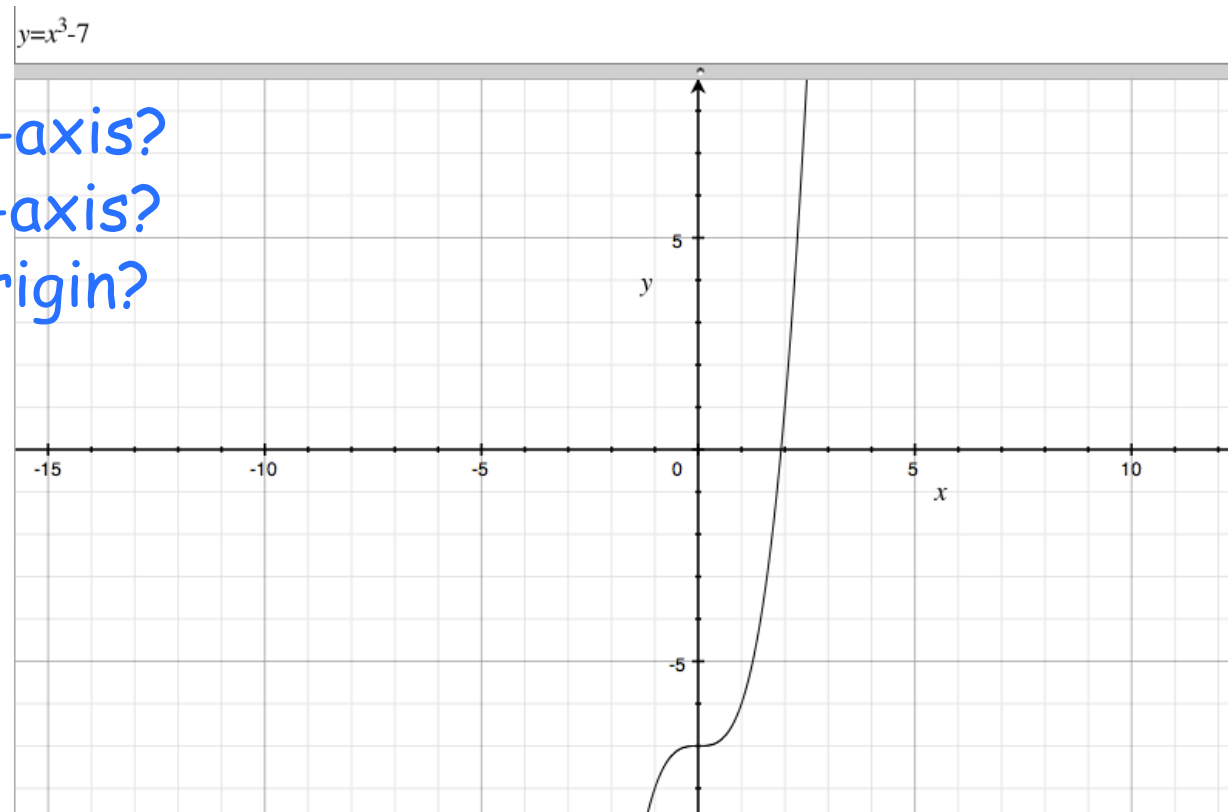
Symmetric to y-axis?

Symmetric to origin?



Function?

Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?

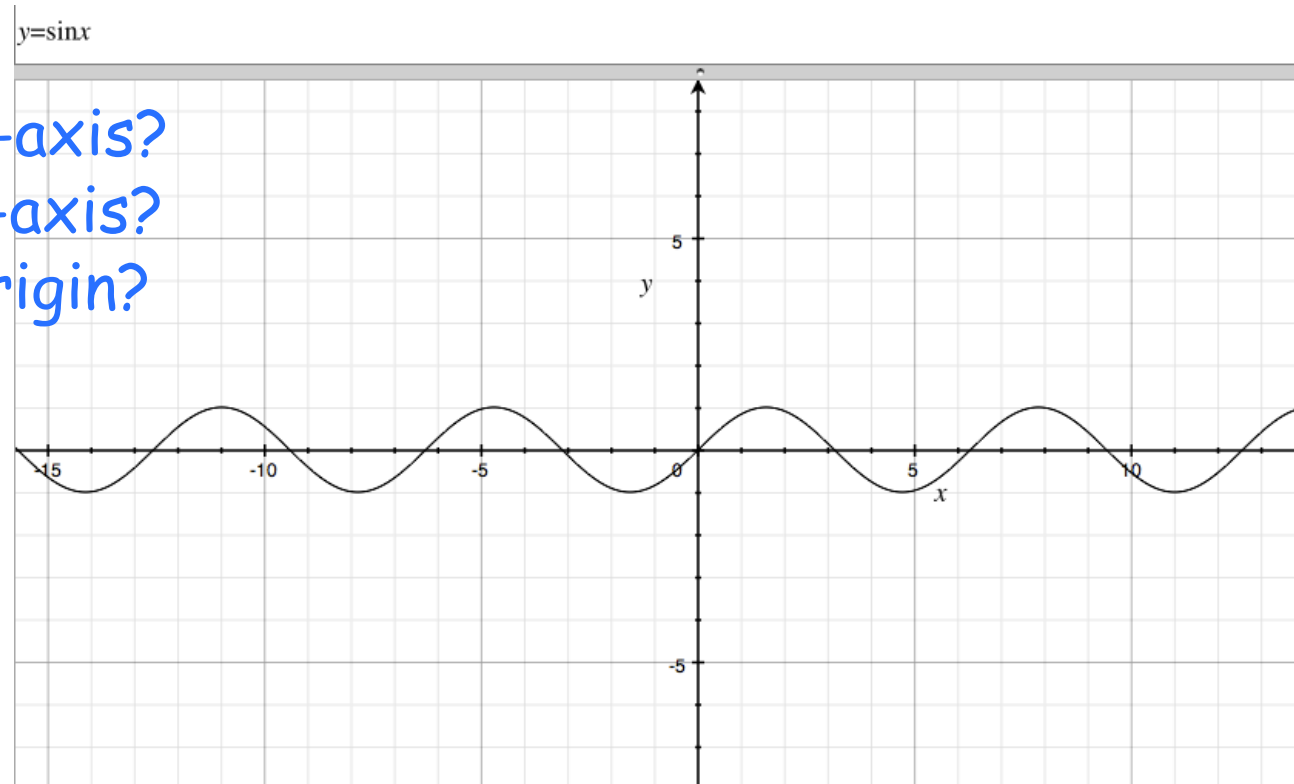


Function?

Symmetric to x-axis?

Symmetric to y-axis?

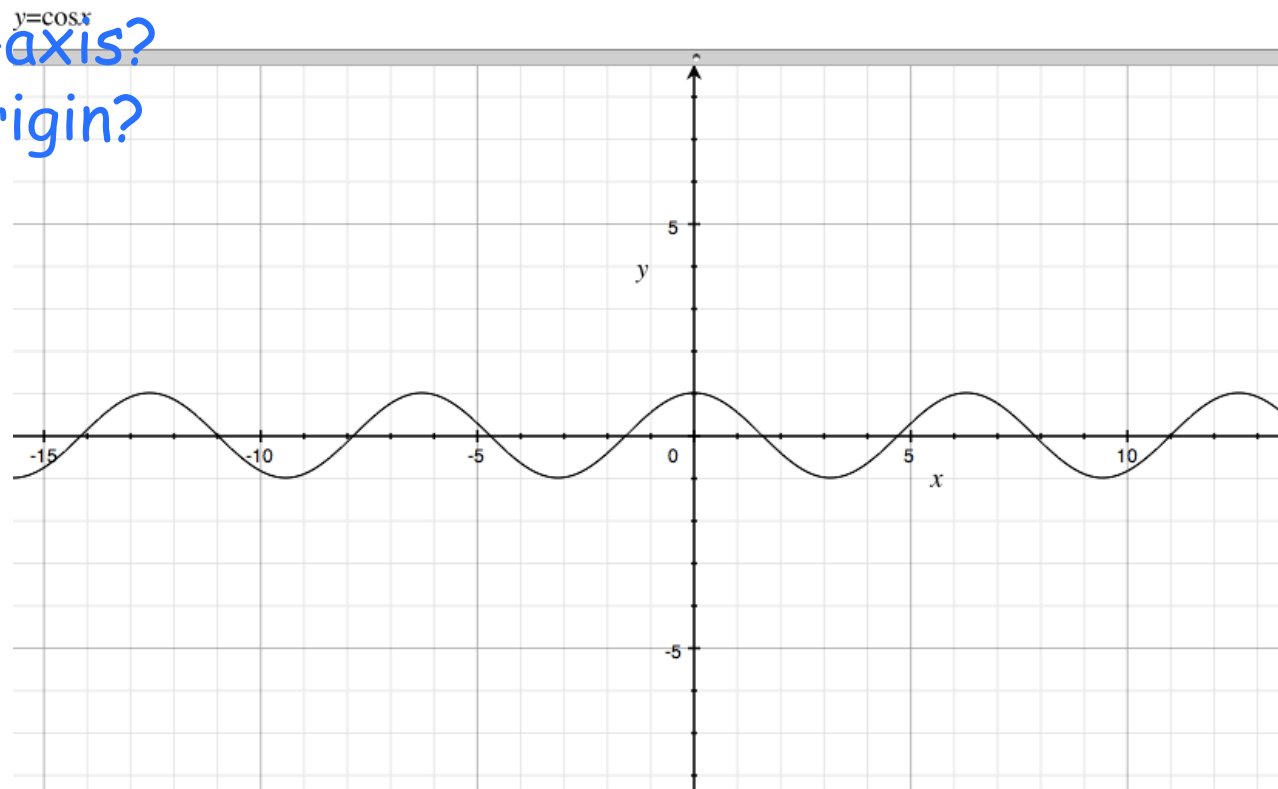
Symmetric to origin?



Symmetric to x-axis?

Symmetric to y-axis?

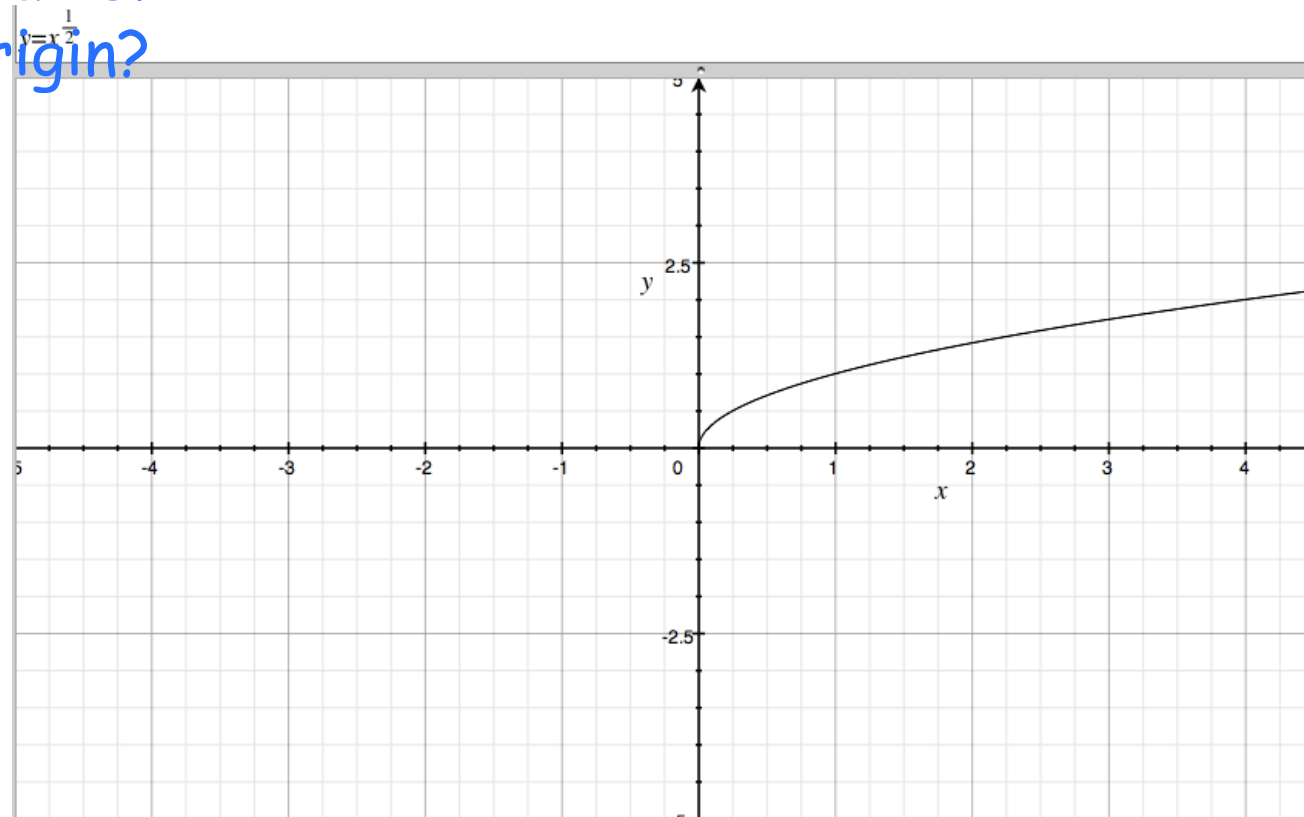
Symmetric to origin?



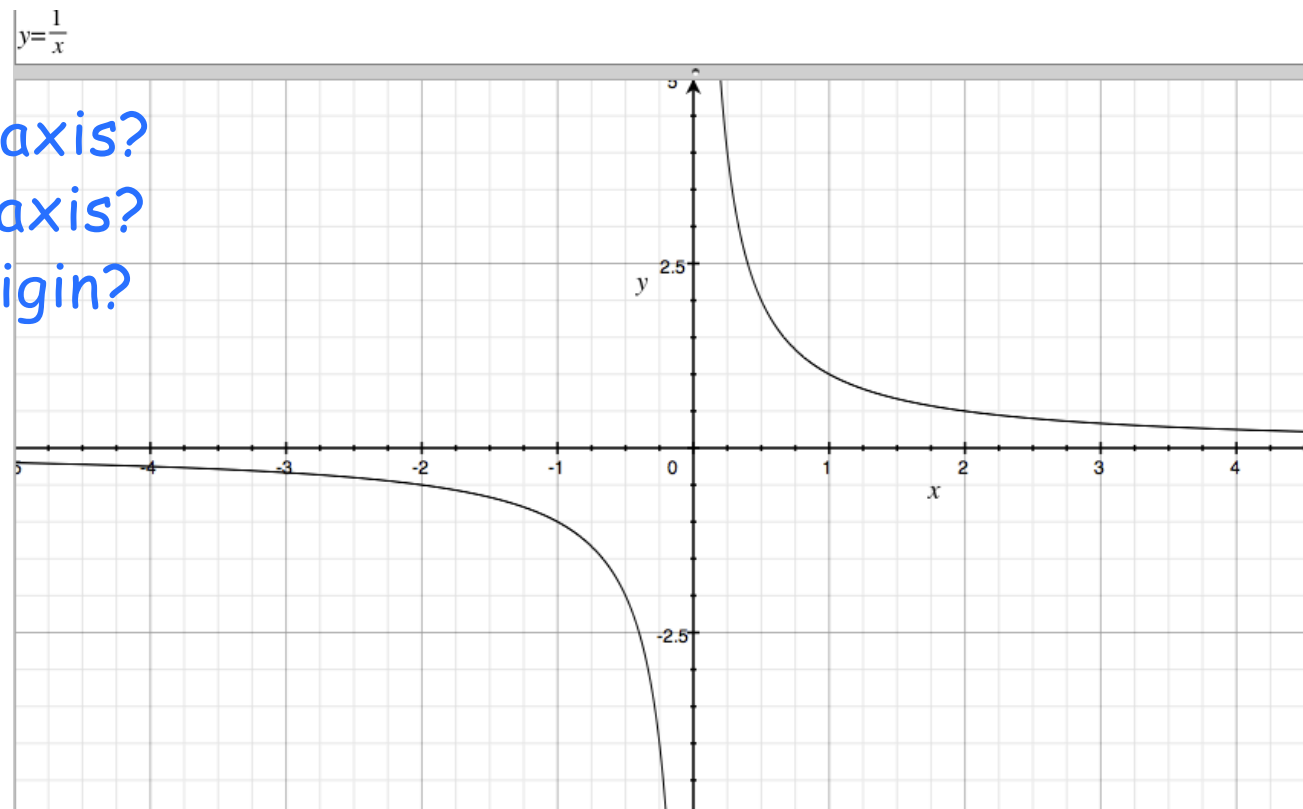
Symmetric to x-axis?

Symmetric to y-axis?

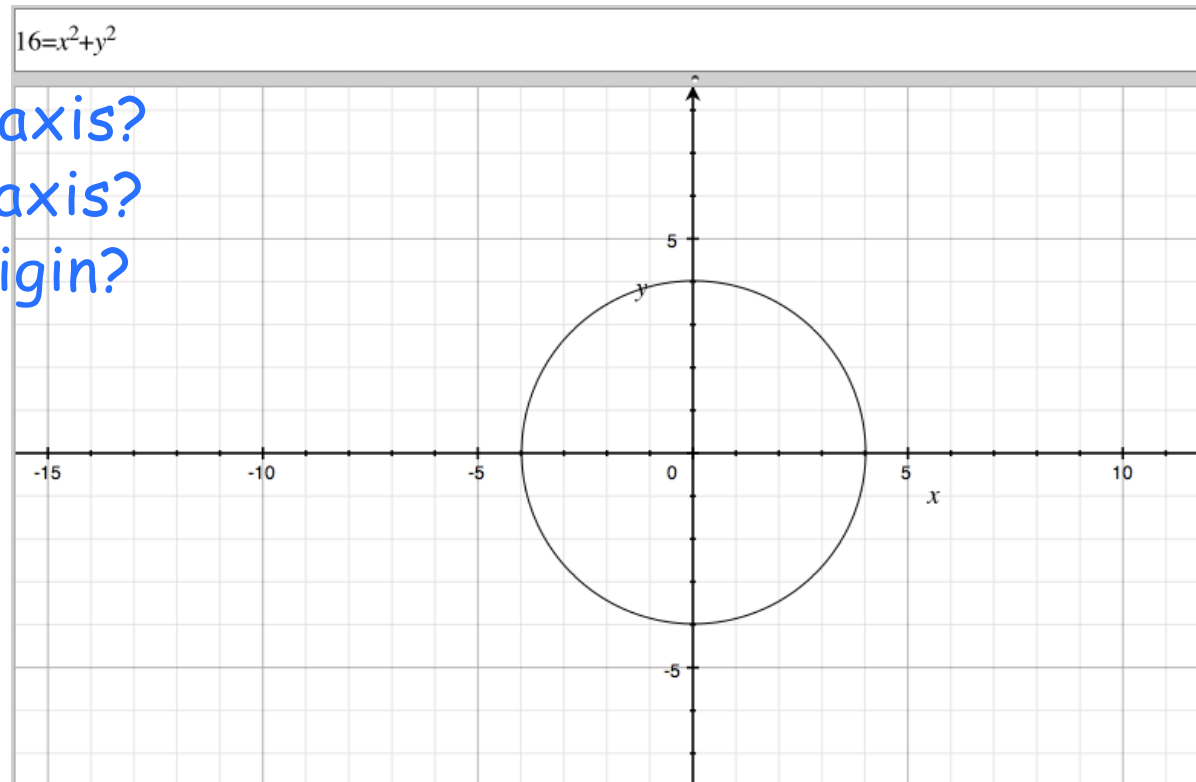
Symmetric to origin?



Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?

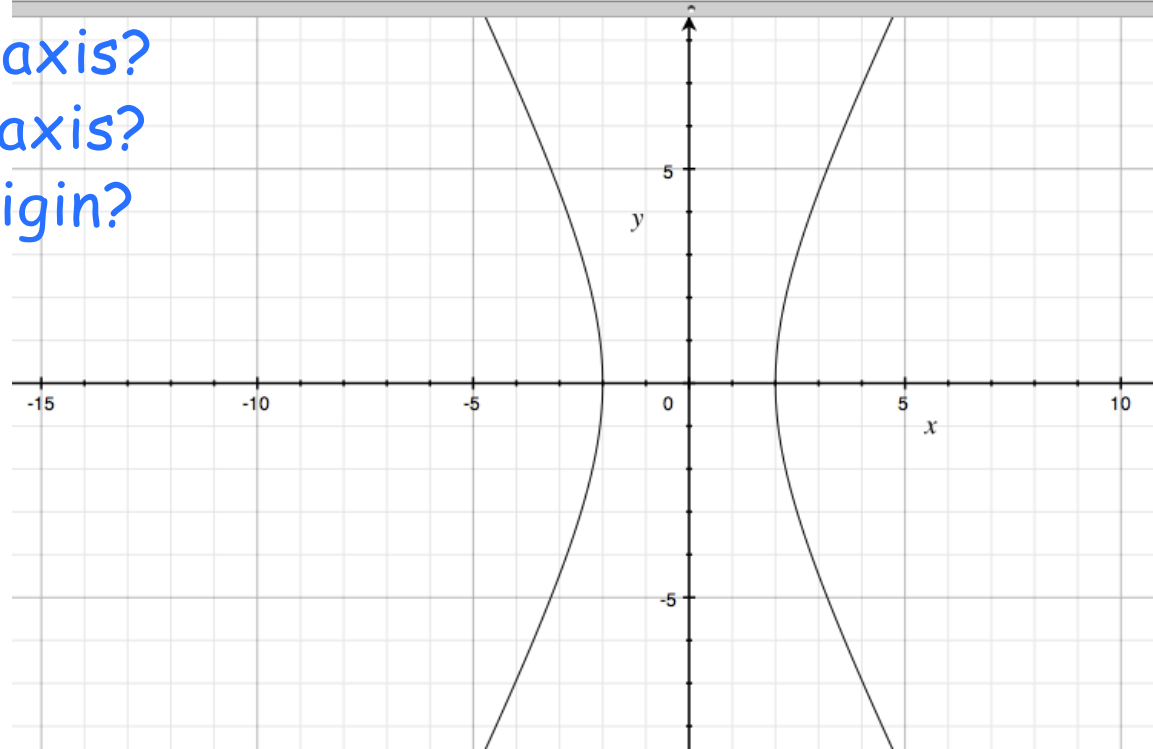


Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?



$$\frac{x^2}{4} - \frac{y^2}{16} = 1$$

Symmetric to x-axis?
Symmetric to y-axis?
Symmetric to origin?

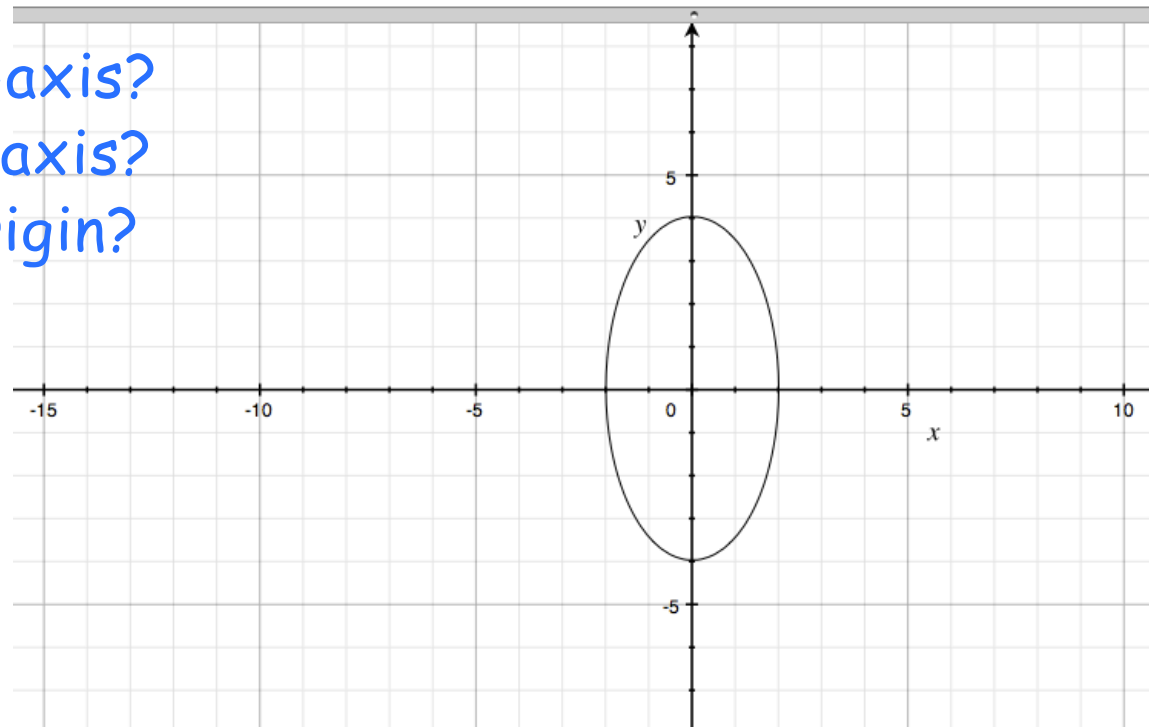


$$\frac{x^2}{4} + \frac{y^2}{16} = 1$$

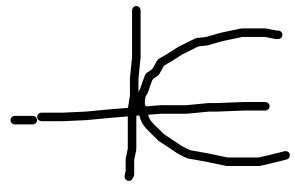
Symmetric to x-axis?

Symmetric to y-axis?

Symmetric to origin?



List the x and y intercepts and test for symmetry with the x-axis, y-axis and origin.



$$y^2 = x$$

y-axis

$$x \rightarrow -x$$

$$y^2 = -x$$

No

x-axis

$$(-y)^2 = x$$

$$y^2 = x$$

Yes

Origin

$$y \rightarrow -y$$

$$x \rightarrow -x$$

$$(-y)^2 = -x$$

$$y^2 = -x$$

No

Example 2

List the x and y intercepts and test for symmetry with the x-axis, y-axis and origin.

$$y^2 - x - 4 = 0$$

X-axis

$$y \rightarrow -y$$

$$(-y)^2 - x - 4 = 0$$

$$y^2 - x - 4 = 0$$

Yes

Y-axis

$$x \rightarrow -x$$

$$y^2 - (-x) - 4 = 0$$

$$y^2 + x - 4 = 0$$

No

origin

$$y \rightarrow y$$

$$x \rightarrow -x$$

$$(-y)^2 - (-x) - 4 = 0$$

$$y^2 + x - 4 = 0$$

No

Example 3

List the x and y intercepts and test for symmetry with the x-axis, y-axis and origin.

$$y = x^4 - 1$$

Example 4

List the x and y intercepts and test for symmetry with the x-axis, y-axis and origin.

$$y = \frac{x^2 - 4}{2x^4}$$

Suppose $f(5) = -3$, find another function value given that:

1 - The graph of $y = f(x)$ is symmetric to the x -axis

2 - The graph of the line $y = f(x)$ is symmetric with respect to the line $y = -2$.

3 - f is an odd function.

Test for symmetry to the x-axis, y-axis and origin.

$$y = 3x^2 + 2$$

$$y = \frac{-3}{x-5}$$

Test for symmetry to the x-axis, y-axis and origin.

$$x = 2y^2 + 5$$

$$xy^3 = -2$$

Test for symmetry to the x-axis, y-axis and origin.

$$x^2 - y^2 = 4$$

$$y = \sqrt[3]{x^2 - 6}$$

Ex7:

Given $f(2)=-6$, find another point of the function if:

a) $f(x)$ is an odd function

b) $f(x)=f(-x)$

c) $f(x)$ is reflected around the x -axis

d) the graph is symmetric to the line of $x=5$

HW pg 245-247 1-40 all

HOMEWORK

p. 246-7: 4-10, 13-20, 31-40

Worksheet: Translations, Reflections, Scalings